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89. The yarn of claim 41 wherein the propylene polymer as present in the filaments has a crystallinity of at least about 30% determined by wide angle X-ray diffraction.

90. The yarn of claim 41 wherein the texture includes twist.

91. The yarn of claim 41 having an Apparent Average Microfibril Diameter greater than 200.

REMARKS

At the outset, Applicants note with appreciation that the rejection in the prior Office Action based on Negola et al. has been overcome.

Claims 60-79, having been added in the prior amendment based on a suggestion by the Examiner, are being canceled to afford prosecution. Independent claims 1, 9, 31 and 41 have been amended to recite that the claimed yarns are textured, that the propylene polymer component thereof is a crystalline polymer and that shrinkage of the yarns is about 1 to about 15%. Basis for the recitation that the yarns are textured appears at page 37 lines 22-30, describing textured yarns as having a preferred form of bulkiness. Basis for the recitation as to polymer crystallinity appears at page 28 lines 6-7. Basis for the recitation as to shrinkage of the yarns is found at page 36 lines 9-19 reciting that preferred yarns have shrinkages of about 1 to about 15%. New claims 80-91 have been added to further define more specific aspects of the claimed yarns. Specifically, claims 80, 83, 86 and 89 further define the polymer of independent claims 1, 9, 31 and 41, respectively, as having crystallinity of at least about 30% determined by wide angle X-ray diffraction, as described at page 28 lines 8-9 of the specification; claims 81, 84, 87 and 91 further define texture of the yarns of the independent claims as including twist, as described at page 37 lines 22-25 and 54 lines 26 to page 55 line 6; and claims 82, 85, 88 and 91 recite Apparent Average Microfibril Diameters of at least 200 Å as described at page 21 line 30 to page 22 line 16 defining the expression "Apparent Average Microfibril

Diameter" and page 33 lines 3-10 stating that the invented yarns have such diameters exceeding the 200 Å diameters of known yarns.

Before specifically addressing the individual rejections of the subject application, Applicants consider it important to review certain aspects of the invention to ensure a thorough understanding thereof.

As discussed at page 20 lines 12-23, Applicants invention proceeded from their discovery that polypropylene carpet yarns prepared in a particular manner showed better compressional recovery than conventional polypropylene carpet yarns, both in compressional recovery testing of yarn plugs by the Plug Crush Recovery Test and in actual carpet testing. As a result of additional detailed study of several fiber and yarn characteristics, Applicants found a correlation between Apparent Average Microfibril Diameter and Plug Crush Recovery test results and, in turn, between Plug Crush Recoveries and carpet testing. The first of those correlations is illustrated in Fig. 3 of the subject application and discussed at page 23 lines 3-11 and page 32 line 30 to page 33 line 23. The second is illustrated in Fig. 4 and described at pages 23-27 of the specification. From Fig. 4 and the Tables at pages 25 and 27, it can be seen that the correlation between PCR Test results and carpet testing results extends both to the quantifiable thickness retention property of carpets and to subjectively determined carpet properties such as overall appearance, tip definition and hand.

While Applicants have discovered these correlations, the Examiner will appreciate that correlation is not necessarily the same as causation. Thus, while increases in Plug Crush Recoveries have been observed with increases in Apparent Average Microfibril Diameters, Applicants have not established that increased Apparent Average Microfibril Diameter is the, or even a, cause of their yarns' compressional recoveries. Accordingly, Applicants have described and claimed the subject matter of their invention with respect to the physical properties that they have observed that distinguish the invented fibers and yarns from the prior art of which they are aware. To this end, US Patent No.

5,945,215, which derives from a common parent provisional application as the subject application, claims fibers on the basis of calculations from X-ray diffraction measurements that may be interpreted in line with the discussion of Apparent Average Microfibril Diameters in the specification. In the subject application, bulked continuous filament yarns made up of a plurality of propylene polymer filaments are claimed in terms of their compressional recovery properties as determined by the Plug Crush Recovery test. As seen from the Summary of the Invention beginning at page 14 line 22 (corresponding to Column 9 line 34 of the patent), and from page 36 line 31 to page 37 line 5 of the specification of the subject application (corresponding to Column 9 line 49-57 of the patent, both the fibers characterized by X-ray diffraction-based calculations and bulked continuous filament propylene polymer yarns characterized by the recited Plug Crush Recoveries are considered new and unobvious based on the known prior art.

Turning to the rejections in the outstanding action, claims 1-7, 16, 17, 22, 31 and 41-47 have been rejected for same invention double patenting in view of claims 11, 14-17, 24 and 25 of US 5,945,215. The Examiner has acknowledged that the claims of the subject application do not recite the Apparent Average Microfibril Diameter as in the patent but states that the same is "an inherent property of the Applicants' claimed yarn." Applicants respectfully traverse.

The subject application and the patent do not claim the same invention. The consisting essentially of language of the rejected claims excludes from the literal scope of those claims polymer compositions within the literal scope of the patent claims. Furthermore, whether or not calculated Apparent Average Microfibril Diameters claimed in the patent is an "inherent property" of the yarns of the subject application, as asserted by the Examiner, it is not a claimed property of the yarns of the application. In any event, as amended herein, the claims of the subject application include additional recitations with respect to yarn texture and shrinkage that differentiate the same from the patent claims in a same invention double patenting sense. Accordingly, the same invention double

patenting rejection is incorrect and inapplicable to the claims as amended herein and, therefore, should be withdrawn.

Claims 1-79 also have been rejected as indefinite under 35 USC 112 based on the claimed Plug Crush Recovery properties and the Examiner's assertion that the claims "do not set forth a specific composition which would meet said property" and "are functional since they cover every conceivable composition which would impart the claimed property, wherein said composition is either presently existing or yet to be discovered." Ex parte Slob, 157 USPQ 172, PO Bd. App., 1968, has been cited in support of this rejection. Applicants respectfully traverse.

At the outset, Applicants claims are not indefinite in reciting Plug Crush Recovery properties of the claimed yarns. The claims recite that the claimed yarns consist essentially of a plurality of filaments that consist essentially of propylene polymer, and that the yarns have Plug Crush Recoveries of at least 85%. The claims have also been amended to recite that the propylene polymer of the filaments is crystalline, that the yarns have recited shrinkage properties and that the yarns are textured. Certain of the independent and dependent claims, e.g., claims 18-21, 26-29, 32-40 further define their yarns, or incorporate recitations, with respect to numbers of filaments, denier of the filaments and denier of the yarns, thereby even more specifically characterizing the yarns. As to the Plug Crush Recoveries recited in the claims, they are physical property test results determined according to a testing procedure described in detail in the specification, including materials and equipment used in carrying it out, sample size, preparation and handling, testing procedures, measurements and calculation of results. As such, the Plug Crush Recoveries recited in the claims are no different from any other physical property tests. That the test is non-standardized, and thus has been described by Applicants rather than found in a published source, does not make the test or its results indefinite or vague. The claimed yarns, being defined in terms of their form (bulk continuous filament yarns that are textured and consist essentially of a plurality of filaments), their

composition (consisting essentially of crystalline propylene polymer) and certain physical properties (Plug Crush Recovery, shrinkage) are not vague or indefinite.

The Examiner's reliance on Ex parte Slob is to support the instant rejection is incorrect for several reasons. First, Slob's claim was to a process, and the vagueness found by the Board of Appeals was with respect to a component used in the process that was defined, not with reference to its composition, but instead the results it produced in the claimed process. Thus, the component was referred to only as a "liquefiable substance" having a "liquefaction temperature" within a recited range and being "compatible with the ingredients in the powdered detergent composition." Against that definition of the substance, its role in Slob's claimed process was to distribute uniformly throughout a mixture thereof with a powdered detergent composition and to be convertible to solid state on cooling so as to bind the detergent composition at the surface of the tablet-shaped mixture "whereby there is formed a strong detergent tablet which disintegrates and dissolves in water in about 15 to 75 seconds . . ." (157 USOQ at 172-3). Slob's claim was held vague because it attempted to define a process reagent not in terms of its own characteristics but, instead, primarily in terms of the result it produced at the end of the process. This is considerably different from the subject application wherein claims to an article - a yarn - include recitations with respect to its own properties.

Ex parte Slob also is distinguishable from the subject application because the claim in Slob had no compositional definition. The substance was defined only as a "liquefiable substance" having a "liquefaction temperature" within a recited range and being "compatible with the ingredients in the powdered detergent composition." In contrast, all of Applicants' claims recite that the claimed yarns consist essentially of crystalline propylene polymer.

Ex parte Slob's condemnation of the "functional" nature of Slob's definition of his reagent also is inapplicable to the subject application. At the outset, 35 USC 112 does not preclude functional language as such, only functional language that is vague and indefinite. Slob's claim was "functional" in that it

attempted to define a composition in terms of its function in a process, not "functional" in the sense of defining a claimed article in terms of physical property testing results of the article itself. In addition, while the Board's stated concern over functional language was that the claim would "cover any conceivable combination of ingredients either presently existing or which might be discovered in the future and which would impart the desired characteristics" (157 USPQ 173), it is readily apparent that applying that concern beyond process claims of the type involved in Slob would produce results at odds with current law and practice. Thus, accepting the above-quoted passage at face value would preclude composition of matter claims other than those limited to known processes for making the composition, and article claims other than those limited to existing materials of construction. Obviously, those results are not in line with accepted practice and a fair interpretation of Slob requires that it not be extended to claims beyond the process claims actually at issue there.

In view of the above, the 35 USC 112 rejection of all claims is incorrect and should be withdrawn.

Claims 60-79 have been rejected on grounds that it is unclear how filaments are oriented. Claims 60-79 have been canceled and therefore this rejection is moot.

Claim 65 has been objected to under 37 CFR 1.75(c) for improper dependency in failing to further limit the subject matter of a previous claim. This objection is also moot in view of cancellation of claims 60-79.

Claims 60-63, 65-67, 69, 70 and 75-79 have been rejected as unpatentable over Martin (US 3,152,380) under 35 USC 102(b) or 103. Claims 64 and 74 have likewise been rejected as unpatentable over the Martin and claims 68 and 71-73 have been rejected as obvious in view of the patent. Claims 60-79 having been canceled herein, this rejection is moot, as are the rejections of claims 60-79 based on Wishman and Lopatin.

Claims 1-5, 7, 10-17, 19-25 and 27-31 have been rejected as unpatentable over Martin under 35 USC 102(b) or 103. In addition, claims 32,

41-59 have been likewise rejected in view of Martin and claims 6, 8, 9, 18, 26, 33-40 have been rejected as obvious from the patent. Reconsideration of this rejection is requested. Although the various rejections based on Martin appear in several separate numbered paragraphs of the outstanding action, they all are treated together in the following discussion.

At the outset, Applicants note that the claims currently pending in the application, while narrower than those originally filed, have now been rejected based on Martin even though the broader claims that were originally filed were not rejected based on that reference. Applicants also note that the Martin reference has been before the Examiner since the application was filed, as seen from the discussion of the patent at page 6 line 23 - page 7 line 13 and elsewhere in the Background section of Applicants' the specification and also from Comparative example 3.

As discussed in the specification, Martin discloses a two step process of drawing fibers as they first solidify on emergence from a spinneret, at a draw ratio of at least 1.5:1, preferably 3:1 to 10:1, and a temperature of at least 80°C, and then heating the drawn fibers in an untensioned state at a temperature of at least 140°C but below the melting point of the fibers for at least one second. Compressional recovery of the fibers, calculated from recovered height of a yarn plug 24 hours after a one minute exposure to a 10,000 psi load relative to height of the initial plug compressed by a sixteen gram wooden dowel, is described as at least 65%, with values of 65-100% (as opposed to 15-20% for untreated fibers) reported in the patent's examples. The patent also notes that recoveries generally increase with increasing heat treatment temperatures. While most of Martin's examples deal with yarns spun from staple fibers, and thus are neither descriptive nor suggestive of the claimed continuous filament yarns, those of the examples dealing with continuous filament yarns (Examples IV and VII) show the yarns to suffer from high shrinkages and also to yield little improvement and accelerated loss of pile height retention at higher levels of foot traffic in actual carpet testing.

Contrary to the Examiner's position that Martin anticipates or makes obvious the claimed yarns, Martin does not disclose or make obvious the claimed yarns. Comparative example 3 clearly shows that yarns made following the teachings of Martin lacked the claimed compressional recovery. While the Examiner has dismissed those results, the reasons stated in the action for doing so are submitted to be incorrect. The first of those reasons, that the four comparative samples "do not appear to cover all of Applicant's claimed embodiments" is believed to reflect incorrect application of the law. From Comparative Example 3, it can be seen that making yarn according to various embodiments of Martin's teachings did not result in a yarn with the recited Plug Crush Recovery. In contrast, that the claimed properties are achieved according to various embodiments of Applicant's claims is seen from the inventive examples of the subject application. The Examiner's second reason for dismissing Comparative Example 3 is said to be that "the property of Plug Crush Recovery is an indefinite claim limitation." That is clearly incorrect. The test is not indefinite and nothing in the Office Action purports to find or establish it as indefinite. The fact is that yarns made according to various embodiments of Martin according to Comparative Example 3 and tested by the same procedure used to test the invented yarns showed considerably lower compressional recoveries than the claimed yarns. Martin's poorer showing in Plug Crush Recovery test results also follows the negligible improvement reported in the patent in carpet testing of his yarns and the poor performance of his yarns as compared to nylon yarns.

The claimed yarns further distinguish over Martin due to the higher shrinkages of the patent's yarns. As seen from Example IV of the patent, Martin's BCF yarns with good compressional recovery had shrinkages of 30-54%. In contrast, all of Applicants' claims recite shrinkages of about 1 to about 15 %.

Martin also fails to disclose the bulk levels recited in independent claims 9, 31 and various of the dependent claims. While the outstanding action would

"presume" that Martin's bulk levels inherently are within the claimed range because both Martin and the application disclose similar bulking techniques, that analysis reflects a hindsight reconstruction of the reference guided by the claims that is clearly improper.

Still further distinctions between the claims and Martin include the crystallinities and Apparent Average Microfibril Diameters recited in claims 80, 82, 83, 85, 86, 88, 89 and 91. It also is noted that the Examiner's reliance on asserted similarities between Martin's method of preparing yarns and methods disclosed in Applicants' specification as supporting the rejections of the application, in addition to reflecting an impermissible hindsight analysis of the reference, is incorrect in important respects, specifically including differences in heating steps. Finally, the Examiner's reliance on "Official Notice" to fill in aspects of the claims not found or suggested in the reference, and especially its use in connection with the anticipation rejections and in connection with Martin with its emphasis on spun yarns from chopped fibers as opposed to the claimed continuous filament yarns, is submitted to extend such Notice beyond its proper bounds.

In view of the foregoing discussion and the amendments made herein, it is submitted that none of the claims is anticipated by or obvious from Martin and that the rejections based on that reference are incorrect and should be withdrawn.

Claims 1-5, 16-25, 30, 41-47, 60-67, 78 and 79 stand rejected as unpatentable over Wishman et al. (EP 0 330 212) under 35 USC 102 or 103 and claims 6-15, 26-29, 31-40, 48-59 have been rejected as unpatentable over Wishman alone or taken with Martin under 35 USC 103. Reconsideration is again requested.

As with Martin, the Wishman published application has been before the Examiner since filing of the subject application yet it was not applied until the second Office Action. As discussed at page 11 lines 14-32 and page 13 lines 3-32 of the specification, Wishman et al. is directed to resilient polypropylene

fibers, said to be suitable for carpets and upholstery, prepared by spinning and drawing polypropylene fibers, imparting to the fibers a particular form of crimp, described as a saw-tooth or two-dimensional crimp, and heat treating the fibers to permanently set the crimp. Heat treating is conducted at about 280°F (138°C) to just below the softening point of the fibers, reported as 320-329°F (160-165°C), and preferably at about 284°F to about 315°F (140-157°C), for a time ranging from five seconds to eight minutes depending on heat transfer capability of the heat treating system and openness of the fiber bundle. Wishman et al. attributes improvements in resiliency to permanently setting his particular two-dimensional crimp in the fibers.

Applicants claims are not anticipated by or obvious from Wishman because the reference is specific to yarns with a particular form of crimp which are treated to permanently set that crimp. In contrast, the claimed yarns are textured yarns. As described at page 37 lines 22-30 of the specification, texturing involves random entanglement, waviness, looping and whirling of filaments in contrast to the two-dimensional crimp of Wishman. In addition, Wishman does not disclose the recited Plug Crush Recoveries and the publication's compressional recovery test (which is also described in the reference as a non-standardized test) is not a useful guide for predicting recovery relative to original properties (as in the case of the Plug Crush Recovery test) because the test disclosed by Wishman bases its results on comparison of recovered sample height to its height as compressed for testing. Wishman also fails to disclose the Apparent Average Microfibril diameters recited in claims 82, 85, 88 and 91. Combination of Wishman with Martin is not suggested given the former's specific requirements as to crimp. Even if combined, however, the claims are unobvious for the reasons stated above and in the discussion of Martin above.

In view of the above and the amendments made herein, Wishman also fails to anticipate or make obvious the claimed yarns and the rejections based on the publication are incorrect and should be withdrawn.

Finally, claims 1-5, 9-70 and 73-79 have been rejected as unpatenable over Lopatin under 35 USC 102 or 103 and claims 6-8, 71 and 72 as obvious from the reference. Reconsideration is requested.

All of the claims are novel and unobvious over Lopatin in view of the recited Plug Crush Recoveries. Lopatin not only fails to disclose that property but does not even include improved compressional recovery or resilience among his disclosed yarn properties. Rather, the reference is simply directed to imparting a particular form of bulkiness to yarns, as described at Column 2 lines 28-30; Figs. 2A-N and description thereof at Columns 6-7. The claims also distinguish over Lopatin because the reference's fibers are prone to undesirable shrinkage, as indicated at Column 7 lines 51-53. It also can be seen from Comparative Example 1 that heating temperatures (145 and 155°C) and times (0.1 -1 second) on the order described in Lopatin (compare Column 7 lines 26-48: 135-155°C; Column 7 lines 33-36: 0.5 to 3 seconds) did not yield the claimed yarns. Further, in contrast to Lopatin, wherein untwisted but not twisted starting yarns are suitable for use, the unacceptable results in Comparative Example 1 were attained with both twisted and untwisted yarns. Further distinctions over Lopatin include the Apparent Average Microfibril Diameters and twist recited in claims 81, 82, 84, 85, 87, 88, 90 and 91.

In view of the above and the amendments made herein, none of the claims of the subject application is anticipated by or obvious from Lopatin and the rejections based thereon are incorrect and should be withdrawn.

In view of the amendments made herein, the foregoing reasons for reconsideration of the rejection and the discussion presented above, it is submitted that the subject application is in condition for allowance and such action is respectfully requested.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read 'S. L. Hensley', written over a horizontal line.

STEPHEN L. HENSLEY
Attorney For The Applicants
Registration Number 28,426
(312) 856-2764